

DTC	P0500	VEHICLE SPEED SENSOR "A"
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CIRCUIT DESCRIPTION

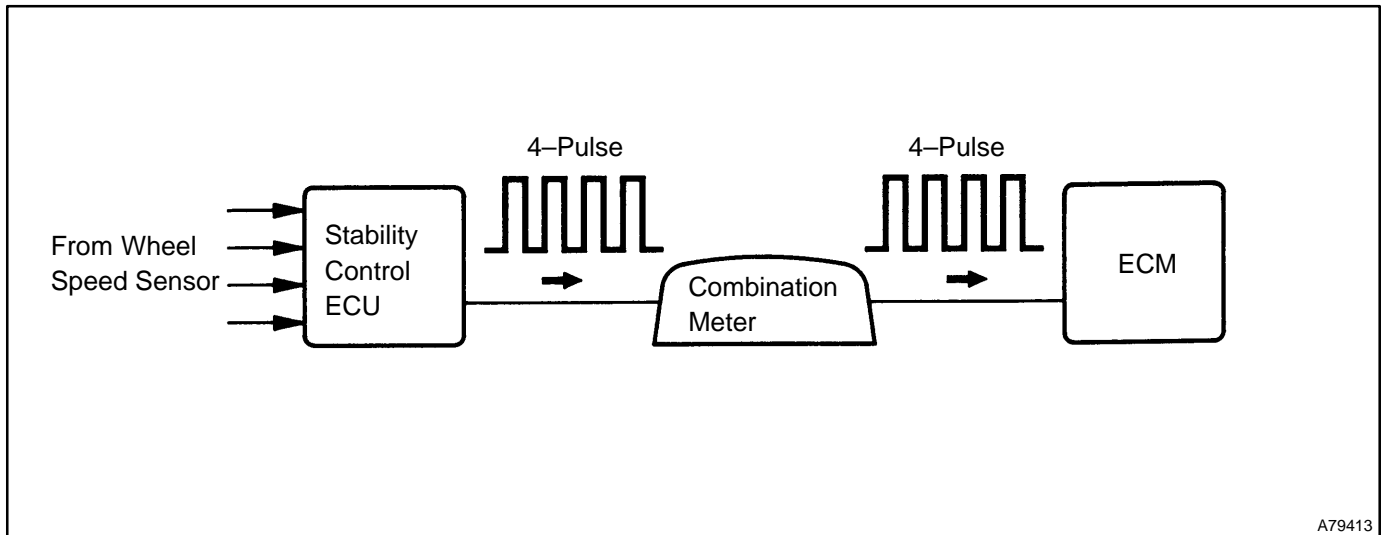
The vehicle equipped with ABS detects a vehicle speed using the stability control ECU and wheel speed sensor. This sensor monitors a wheel rotation speed and sends the signal to the ECU.

The stability control ECU converts these wheel speed signals into a 4-pulse signal and outputs it to the ECM via the combination meter.

The ECM determines the vehicle speed based on the frequency of these pulse signals.

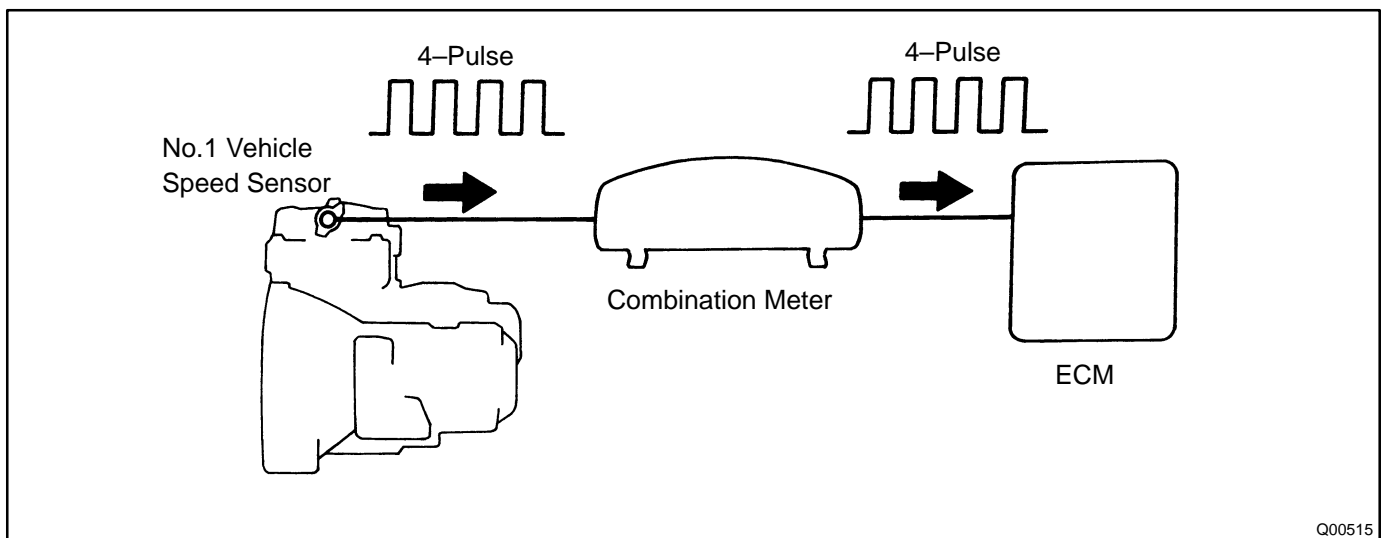
In the vehicle without ABS, the No. 1 vehicle speed sensor outputs a 4-pulse signal for every revolution of the rotor shaft, which is rotated by the transmission output shaft via the driven gear. After this signal is converted into a more precise rectangular waveform by the waveform shaping circuit inside the combination meter, it is then transmitted to the ECM. The ECM determines the vehicle speed based on the frequency of these pulse signal.

w/ ABS:



A79413

w/o ABS:



Q00515

DTC No.	DTC Detection Condition	Trouble Area
P0500	The ECM detects following conditions simultaneously 500 times (2 trip detection logic): <ul style="list-style-type: none"> • No SP1 (speed sensor) signal while ECM detects SP2 (No. 2 speed sensor) signal • Vehicle speed is 6 mph (9 km/h) or more for 4 seconds • Park/Neutral position switch is OFF (Shift lever is in other than P and N positions) • Transfer is in other than N position 	<ul style="list-style-type: none"> • Open or short in speed sensor circuit • Speed sensor • Combination meter • ECM • Stability control ECU

MONITOR DESCRIPTION

Equipped with ABS:

The ECM assumes that the vehicle is driven when the RPM of the transmission counter gear indicates more than 300 rpm and it has been over 30 seconds since the park/neutral position switch was turned OFF. If there is no signal from the vehicle speed sensor with these conditions satisfied, the ECM concludes that there is a fault in the vehicle speed sensor. The ECM will turn on the MIL and a DTC is set.

Not equipped with ABS:

The ECM assumes that the vehicle is driven when the park/neutral position switch is OFF and it has been over 4 seconds since the actual vehicle speed was 9 km/h or more.

If there is no signal from the vehicle speed sensor with these conditions satisfied, the ECM concludes that there is a fault in the vehicle speed sensor. The ECM will turn on the MIL and a DTC is set.

MONITOR STRATEGY

Related DTCs	P0500	Vehicle speed sensor "A" pulse input error
Required sensors/components	Main sensors	Vehicle speed sensor
	Related sensors	Park/Neutral position switch, engine coolant temperature sensor, combination meter
Frequency of operation	Continuous	
Duration	w/ ABS: 2 seconds w/o ABS: 8 seconds	
MIL operation	2 driving cycles	
Sequence of operation	None	

TYPICAL ENABLING CONDITIONS

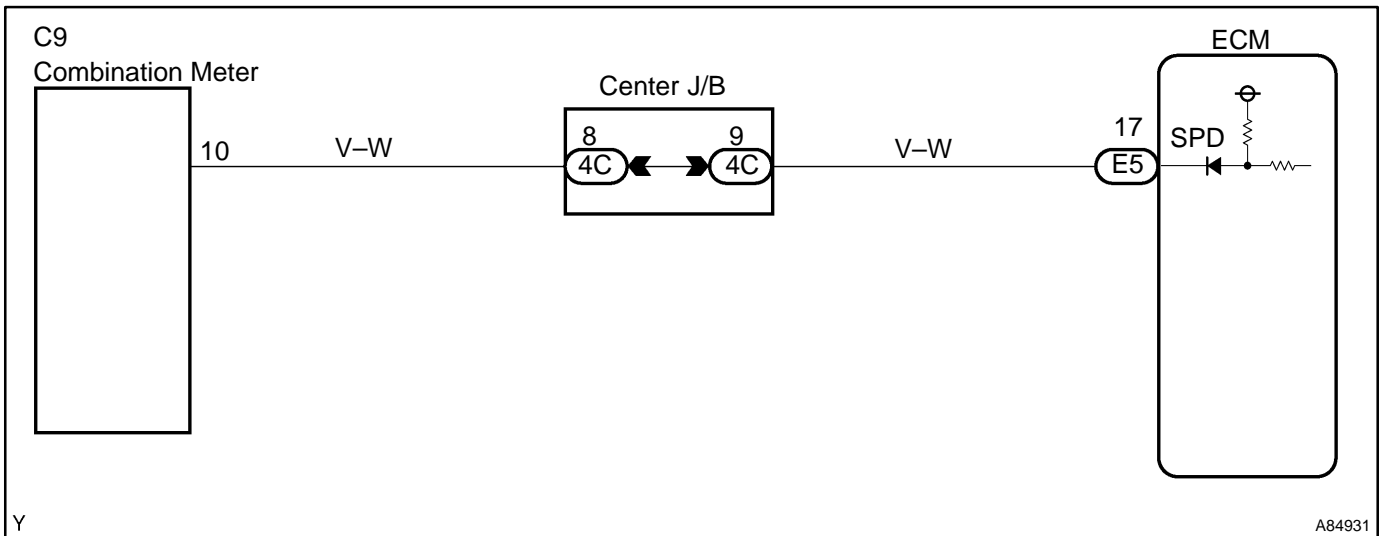
Item	Specification	
	Minimum	Maximum
The monitor will run whenever the following DTCs are not present	See "List of Disable a Monitor" (On page 05-25)	
w/o ABS:		
Engine coolant temperature	70 °C	–
Engine speed	2,000 rpm	5,000 rpm
Intake air amount per engine revolution	0.42 g/rev	–
Fuel cut at high engine speed	Not executing	
w/ ABS:		
Either of following condition is met	(a) or (b)	
(a) Following conditions are met	1 and 2	
1. Engine coolant temperature	20°C	–
2. Time after park/neutral position switch ON to OFF	10 seconds	–
(b) Following conditions are met	1 and 2	
1. Engine coolant temperature	–	20°C
2. Time after park/neutral position switch ON to OFF	30 seconds	–

Engine speed	2650 rpm (vary with throttle opening angle)	-
Detection time on intake air temperature	2 seconds (Intake air temperature is -10°C or more)	-
	8 seconds (Intake air temperature less than -10°C)	-
Time after IG SW ON	3 seconds	-

TYPICAL MALFUNCTION THRESHOLDS

Detection Criteria	Threshold
Vehicle speed sensor signal	No pulse input

WIRING DIAGRAM



INSPECTION PROCEDURE

HINT:

Read freeze frame data using the hand-held tester or the OBD II scan tool. Freeze frame data records the engine conditions when a malfunction is detected. When troubleshooting, it is useful for determining whether the vehicle was running or stopped, the engine was warmed up or not, the air-fuel ratio was lean or rich, etc. at the time of the malfunction.

1 CHECK OPERATION OF SPEEDOMETER

(a) Drive the vehicle and check if the operation of the speedometer in the combination meter is normal.

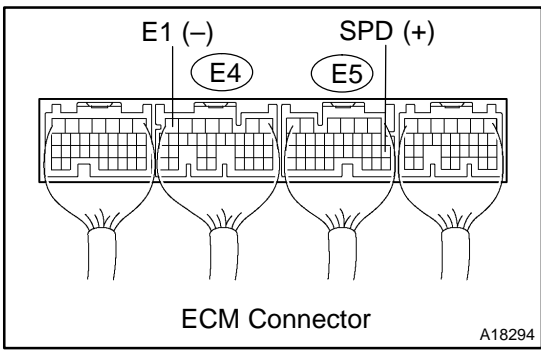
HINT:

The vehicle speed sensor is operating normally if the speedometer display is normal.

NG → **CHECK SPEEDOMETER CIRCUIT**
(See page 05-640)

OK

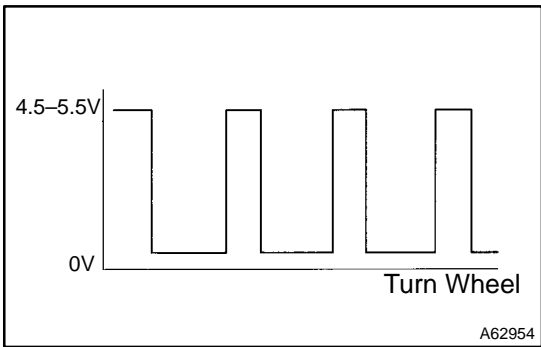
2 INSPECT ECM (SPD VOLTAGE)



- (a) Shift the lever to the neutral position.
- (b) Jack up the vehicle.
- (c) Turn the ignition switch ON.
- (d) Check the voltage between the terminals of the E4 and E5 ECM connectors as the wheel is turned slowly.

Standard:

Tester Connection	Specified Condition
SPD (E5-17) - E1 (E4-7)	Voltage is generated intermittently



HINT:

The output voltage should fluctuate up and down similarly to the diagram on the left when the wheel is turned slowly.

NG REPAIR OR REPLACE HARNESS OR CONNECTOR

OK

REPLACE ECM (See page 10-11)